

ON SOME NORTHWESTERN ANTS AND THEIR GUESTS.

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These notes are based on a collection of ants and myrmecophiles made by the writer in Washington and Idaho, during 1908-1909, while a student at the State College of Washington, at Pullman. Some collecting had been done previously at Helena, Montana, and six weeks were spent at the Puget Sound Marine Laboratory on Orcas and San Juan Islands, Puget Sound, where considerable collecting was done.

I am under obligations to Prof. William M. Wheeler of Harvard University, for determining my ants, and to Prof. A. L. Melander, through whom I was given opportunities to visit and collect in a number of localities. This paper was prepared in the Entomological laboratory of Stanford University.

In collecting little sifting was done, but traps were used wherever practicable. A piece of board or a flat stone buried in a mound proved a good means to attract inquilines.

Solenopsis molesta Say.—Common in vicinity of Pullman and Wawawai, Wash.

Pheidole oregonica Emery.—Common at Pullman and Wawawai, Wash. At the latter place, four specimens of *Cremastochilus knochii* were found in a nest. A great many other nests were examined, but no inquilinous beetles were found.

Aphaenogaster subterranea Latr. subsp. **occidentalis** Emery.—Many nests examined at Pullman and Wawawai, Wash. During April and the early part of May the Pselaphid *Ctenestes pulvereus* Lec. was taken commonly, nearly every nest containing one or two. April 10, Prof. A. L. Melander took a number of specimens of an undescribed *Batrisus* with this ant at Kendrick, Idaho. Several nests were examined and all contained the beetles. A single specimen of *C. pulvereus* was found here also.

Pogonomyrmex occidentalis Cress.—Occurs commonly in the Snake River Canyon at Wawawai, and at Lewiston, Idaho.

Myrmica rubra L. subsp. **brevinodis** Emery.—Taken at Helena, Montana.

Myrmica scabrinodis Nyl. var. **sabuleti** Meinert.—A nest on San Juan Island, Puget Sound.

Leptothorax curvispinosus Mayr subsp. **rugatulus** Emery. Taken at Helena, Montana.

Tapinoma sessile Say.—Common throughout Washington. A large number of nests were examined and no myrmecophiles found. But in the vicinity of Ellensburg, Wash. (March 12, 1909) the tiny cricket, *Myrmecophila oregonensis* occurred in every nest examined.

On Orcas Island, Puget Sound, nests of the pale variety of this ant were often exposed in lifting the bark from fallen trees, and in one nest there were three specimens of a Staphylinid, determined by Dr. A. Fenyès as *Zyras* (*Myrmæcia*) *lugubris* Casey. This beetle, when the nest is uncovered, runs about among the ants, with the tip of the abdomen raised. Wasmann has placed the European *Myrmæcia fussi*, also commensal with *Tapinoma*, as a synechthran, and it has been observed to eat the ants. I have not examined the other species, but in *lugubris*, on the dorsum of the penultimate segment of the abdomen, are typical golden trichomes, characteristic of symphiles. So if *lugubris* does feed on the ants, here is a case of a predaceous insect with adaptations toward making itself tolerated by its intended prey, an example even more extreme than *Xenodusa*, which confines its attacks to the larvæ of the ants.

Iridomyrmex analis André.—At Wawawai, Wash. Rare.

Lasius niger L. var. **neoniger** Emery.—Abundant in the vicinity of Pullman, where numerous nests were examined. Myrmecophiles were taken on two occasions only. May 13th a single specimen of *Hetærius tristriatus* Horn was found among a thick cluster of ants on the under side of a stone, and two specimens of the blind *Adranes taylori* Wick. were taken on the same date, from another nest.

Lasius niger L. var. **americanus** Emery.—*Adranes taylori* was taken in numbers with this ant at Troy, Idaho, in May. The nests were first visited in the afternoon and the beetles found in the upper galleries of every nest examined. No other myrmecophiles were found in these nests, but in July on San Juan and Orcas Islands, Puget Sound, *Myrmecophila formicarum* was abundant.

Lasius brevicornis Emery.—A single nest found at Pullman, Wash.

Lasius (*Acanthomyops*) **interjectus** Mayr. Common near Pullman. Many nests were examined, some of them repeatedly. The only guests were a pair of *Adranes taylori*, taken March 22.

Lasius (*Acanthomyops*) **latipes**.—One nest, found under a stone on the banks of the Snake River, at Wawawai, contained eleven specimens of *Adranes taylori* and one of *Triballus californicus*. Though the latter beetle is often found in ant nests, it is as frequently found away from them, and is doubtfully commensal.

Formica sanguinea subsp. **subintegra** Emery, and **Formica subpolita** var. **picea** Emery.—A mixed colony found under a stone in the vicinity of Pullman, Wash.

Formica sanguinea subsp. **subnuda** Emery, and **Formica dakotensis** Emery.—Mixed colonies abundant at Troy, Idaho, in May and June, nesting in rotten logs and stumps.

Formica rufa subsp. **obscuripes** Forel.—This, the common mound-building ant of the Northwestern states, is the most conspicuous ant in eastern Washington. Several large colonies, located on the campus of the State College, were regularly examined throughout the spring. March 1, I took with this ant a single specimen of *Platymedon laticollis* Casey. This brightly colored little staphylinid was later found common in most of the mounds examined, and may be considered as the characteristic inquiline of that ant in Eastern Washington. It was found in all parts of the nests, generally where the ants were thickest and in no instance did I observe the ants to molest or even notice it.

The most interesting find with *obscuripes* was a species of *Aphodius*. Three specimens were taken on March 5 from a populous nest, which had been previously baited with a piece of board. Although the allied genus *Euparia* is an ant guest, no *Aphodius* has been recorded as myrmecophilous, so the occurrence of these three specimens was thought accidental. The board was carefully examined and replaced on the nest. The next day another of the beetles was taken, and specimens continued to turn up until March 18. In all eight were taken from the one nest.

The finding of this species, belonging to a genus normally coprophagous in habit, in an ant nest may seem too slight an

evidence for considering it myrmecophilous, but the repeated occurrence during a period of over two weeks' time may have some significance. The beetle is apparently new, and I am describing it as *Aphodius suspectus* sp. nov.

Toward the middle of March, larvæ of *Microdon* were very numerous in the nests. These pupated in the early part of April, and I collected a number to rear. The first adult emerged April 20, and others from then until the middle of May. The species is evidently a variety of *Microdon tristis* Loew.

One specimen of *Cremastochilus pilosicollis* was taken on March 26, and two more were found in April. Toward the middle of May they became abundant, twenty-eight being taken from one nest. When the nests were uncovered *pilosicollis* would be seized by the legs and thoracic angles by numbers of ants. In two instances ants retained their grip even after death in the alcohol bottle. Larvæ of *pilosicollis* were often exposed, but the ants did not attack them. I have examined a series of fifty adults from the nest of *obscuripes* and failed to find a single mutilated specimen, so this ant must be much more tolerant of *Cremastochilus* than *Pogonomyrmex*, or even *Camponotus*, with which mutilated beetles of this genus are often found. This is surprising, for to judge from the ordinary behavior of *obscuripes*, tolerance is the last quality to be expected.

One specimen of a small scavenger beetle, *Tachyporus californicus*, was in one nest, and in another a single *Cremastochilus knochii*. A spider, kindly determined for me by Mr. Banks as *Tmeticus perplexus* Keyes, was very often found, generally deep in the nest. It may feed on the very young ant larvæ. Large spiders, most commonly Thomisidæ, are not uncommon on the outskirts of nests of other ant species. They are very often seen holding dead ants, so their proximity to the nest is easily explained.

Formica rufa subsp. **integra** var. near **coloradensis** Wheeler. A number of specimens were sent to me from Medford, Oregon, by Mr. C. M. Keyes, and with them a number of *Coscinoptera* cases. No adults emerged from these.

Formica rufa subsp. near **integra** Nyl.—Several nests examined on San Juan Island. *Myrmecophila formicarum* abundant.

Formica fusca var. **argentata** Wheeler.—Common in vicinity of Pullman, either in independent nests or as slaves of *Polyergus rufescens* subsp. *breviceps* Emery. A mixed nest examined March

5 contained one *Heterius tristriatus*, and one *Hister subopacus*. Another contained one *H. tristriatus*. A third nest, a flourishing one, was under observation from March 24 to June 1, during which time six *Cremastochilus knochii*, one *C. pilosicollis*, seven *Heterius tristriatus*, and six specimens of an undescribed species of *Heterius*, were taken. All of these myrmecophiles and also *Myrmecophila manni* Schimmer, were taken with independent colonies of *argentata* at Pullman and at Wawawai. The new *Heterius* I am describing as *H. exiguus* sp. nov.

Formica fusca var. between **neoclara** and **argentata**.—

Common at Wawawai, Wash., where, during March, every nest sheltered numerous inquilines—*Heterius tristriatus*, *Cremastochilus knochii*, *Myrmecophila manni*.

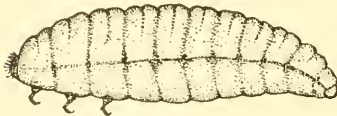


Fig. 1. Coleoptera larva, probably a Coccinellid, taken with *Formica camponoticeps*.

Formica fusca var. **subaenescens** Emery.—One *Cremastochilus knochii*, San Juan Island, Wash., July, 1910.

Formica fusca var. **neorufibarbis** Emery.—San Juan Island, Wash., *Myrmecophila formicarum* Scudder was abundant.

Formica fusca.—Three undescribed varieties on San Juan Island, in July. *Myrmecophila formicarum* occurred in all, and with one, two specimens of *Cremastochilus pilosicollis* were taken, one of them by Prof. McConnell, of the Pennsylvania State College.

Formica subpolita var. **neogagates** Emery.—Very common in vicinity of Pullman. *Cremastochilus knochii* occurred in nearly every nest during March. *Myrmecophila manni* was found, but rarely.

Formica manni Wheeler.—Nests found at Wawawai, Pullman, Wapota, Kiona, and Wenatchee, Wash. This seems to be the characteristic *Formica* of the upper Sonoran zone in Washington, and it occurs also in the Transition zone at Pullman. A single

specimen each of *Heterius tristriatus* and *Cremastochilus knochii* were taken with this ant at Wenatchee.

Formica camponoticeps Wheeler.—The only nest found was under a flat stone at Wawawai, March 28, 1909. In the nest were two remarkable, soft-bodied Coleopterous larvæ, which I have been unable to determine definitely, though they are probably Coccinellidæ. These larvæ (fig. 1) were in the runways of the nests. In life they were covered densely with a white powder, and some of this remains after an immersion of two years in alcohol. The alcoholic specimens are 6–7 mm. in length; 2.5 mm. greatest width, 2.25 mm. at greatest height.

Camponotus maculatus subsp. **vicinus** Mayr.—One specimen of *Xenodusa montana*, (?) Casey, taken at Helena, Montana, April 16, 1907.

Camponotus herculeanus subsp. **pennsylvanicus** De Geer. *Myrmecophila formicarum* was abundant with this ant on San Juan Island, Wash., in July.

Camponotus maccooki Forel.—Mr. C. M. Keyes sent me this species from Medford, Oregon, and with it several specimens of *Myrmecophila formicarum*.

Aphodius suspectus sp. nov.

Length 4 to 5 mm., oblong black, shining. Head coarsely punctate, some of the punctures on the front confluent; a narrow transverse impunctate ridge, extending transversely across the head at about one third distance from base; in front of this ridge depressed, then elevated to a low flat tubercle; depressed between this and margin; margined for entire length, margin with row of fine hairs, which end in front of eyes in a brush of longer hairs; front with a few fine, short hairs; elypeus shallowly emarginate. Prothorax broader than long, feebly narrowed behind, at base slightly wider than elytra; sides moderately margined; base with feeble marginal line; sides slightly convex, disc shining, convex, strongly punctate, the punctures arranged unevenly, and varying in size; a longitudinal impunctate line at middle of disc, running entire length of disc; margin with a row of short even hairs; a few fine scattered hairs on disc.

Elytra brownish, $1\frac{2}{3}$ as long as prothorax, brownish yellow, apex brown; suture and margin sometimes brown; sides nearly straight for one half distances from base, then gradually rounded to apex; striae, moderately impressed, the outer three

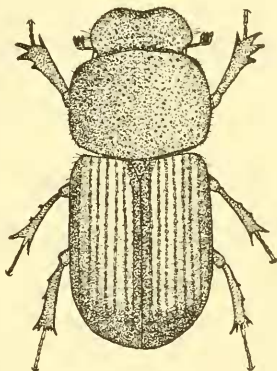


Fig. 2. *Aphodius suspectus* sp. nov.

becoming confluent before apex; each stria with row of punctures; fine scattered hairs on elytra.

Body beneath black, everywhere with fine hairs; mesosternum posterior to coxæ finely granular; disc of metasternum flat, shining, with few punctures; sides of metasternum divided into two triangular areas, the outer, anterior part opaque and strongly punctate, the posterior part smooth and shining.

Legs dark brown to black, tarsi reddish brown.

Described from eight specimens from nest of *Formica rufa* subsp. *obscuripes*, Pullman, Wash.

The width of the sutural stripe is variable. In two of the specimens before me the punctures of the striæ are larger and brown, and the striæ appear as brown stripes. There is a perfect gradation from this to the totally unstriped form. Structurally this species can be assigned to none of Horn's groups of the genus.

I have placed paratypes of *A. suspectus* in the collections of H. C. Fall, H. F. Wickham, and E. C. Van Dyke.

Hetaerius exiguus sp. nov.

Shining, color light reddish to dark brown; form rather elongate. Head above very faintly punctured, with few hairs; clypeus with stronger punctures; front slightly concave.

Prothorax transverse; sides straight, convergent from base to oblique truncation of outer angle; disc very minutely punctured; punctures without evident hairs; no evident hairs on prothorax except short brush at margin; lateral portion not more noticeably punctate than the disc, separated from rest of disc by shallow groove, which terminates in depression at anterior and at posterior margin: divided at basal third by shallow, oblique impression, the posterior portion slightly convex, slightly elevated.

Elytra at base a little wider than prothorax, marginal striæ complete, discal striæ nearly attaining the apex of the elytra, hairs few, short and fine, stronger at margins and toward apex, most of the disc not noticeably hairy. Prosternum margined for five eighths of the distance from base, the margined posterior of disc impunctate and shining, anterior part coarsely punctured.

Anterior femora about two sevenths as wide as long.

Eleven specimens taken at Pullman, Wash., during April and May 1910, with *Formica sanguinea* var. *argentata* Wheeler, either in independent nests or with *Polyergus*. One specimen, April 4 at Kendrick, Idaho, with the same species of ant. One at Kendrick, Idaho, April 1, with *Stenammas* (*Aphænogaster*) *subterranea* var. *occidentalis*. This is the least hairy and most elongate

of the known American species. It appears to be nearest to *H. minimus* Fall, from which it differs in the inconspicuous punctation and pubescence, the narrow femora and more concave front. In these characters it approaches *H. brunneipennis*. It can be separated from this species by the smaller size, more elongate body and total absence of long yellow hairs. In *brunneipennis*

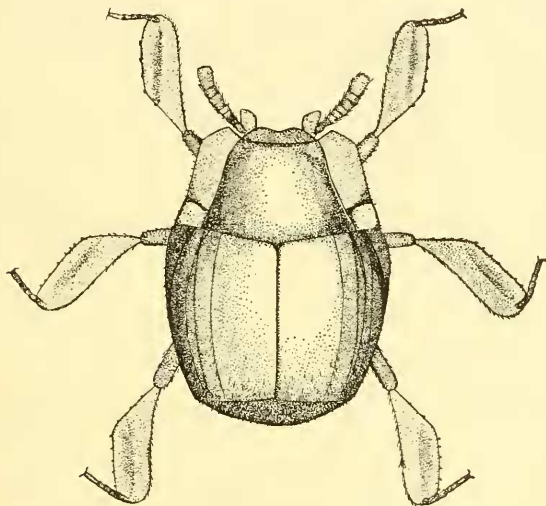


Fig. 3. *Hatærius exiguus* sp. nov.

the margin of the pronotum is more noticeably punctured than the disc, while in *minimus* and *exiguus* there is no appreciable difference.

In the same specimens the elytral hairs are more noticeable and can be seen the entire length of the striae, becoming stronger posteriorly. There exists a wider variation in color than is common in the genus. The elytra and pronotum are seen to be irregularly punctate.